(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 5 February 2004 (05.02.2004)

(10) International Publication Number WO 2004/011517 A1

(51) International Patent Classification7: C08L 23/08

C08F 297/08.

(21) International Application Number:

PCT/GB2003/003217

(22) International Filing Date:

29 July 2003 (29.07.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

0217520.6

29 July 2002 (29.07.2002)

- (71) Applicant (for all designated States except US): BORE-ALIS TECHNOLOGY OY [FI/FI]; P.O. Box 330, FIN-06101 Porvoo (FI).
- (71) Applicant (for GB only): CAMPBELL, Neil [GB/GB]; 179 Queen Victoria Street, London EC4V 4EL (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): MYHRE, Ole, Jan [NO/NO]; Borealis AS, N-3960 Stathelle (NO), SKAR, Merete [NO/NO]; Lärer Johnsensvei 2, N-3960 Stathelle (NO). DAVIKNES, Hans, Georg [NO/NO]; Tryms vei 8, Stathelle (NO). BROVE, Kjetil, Larsen [NO/NO]; Kalliasen 23, Stathelle (NO). JOHANSEN, Geir, Morten [NO/NO]; Borealis AS, N-3960 Stathelle (NO).

- (74) Agent: FRANK B. DEHN & CO.; 179 Queen Victoria Street, London EC4V 4EL (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA. CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

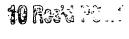
Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SHRINK FILM

(57) Abstract: A shrink film comprising a polyethylene film, characterized in that said polyethylene is an ethylene copolymer mixture having a molecular weight distribution in the range 10 to 35, a density of 915 to 940 kg/m³, a weight average molecular weight of at least 100000 D and an MFR_{2.16} (190 °C) of 0.1 to 0.9 kg/m³, which copolymer mixture is produced by a two or more stage copolymerization of ethylene and 2 to 10 % mole (relative to ethylene) of a C₃₋₁₂ alpha-olefin comonomer in a series of reactors including at least one slurry loop reactor and at least one gas phase reactor using a heterogeneous Ziegler-Natta catalyst.





INTERNATIONAL SEARCH REPORT

Internati Application No PCT/GB 03/03217

								
A. CLASSIFICATION OF SUBJECT MATTER IPC 7 COBF 297/08 COBL 23/08								
According to International Patent Classification (IPC) or to both national classification and IPC								
		alion and IFC						
	SEARCHED	on sumbala)						
Minimum documentation searched (classification system followed by classification symbols) IPC 7 COSF COSL								
Documentat	ion searched other than minimum documentation to the extent that s	such documents are included in the fields se	erched					
Electronic da	ata base consulted during the International search (name of data base	se and, where practical, search terms used						
EPO-Internal, WPI Data, PAJ								
C. DOCUMENTS CONSIDERED TO BE RELEVANT								
Category °	Citation of document, with indication, where appropriate, of the rel	evant nassages	Relevant to claim No.					
		Ovum passages	HOISVOIL TO GILLIN 110.					
A	EP 0 773 257 A (UNION CARBIDE CHEM PLASTIC) 14 May 1997 (1997-05-14) cited in the application the whole document		1–20					
Α	WO 99 41310 A (BOREALIS POLYMERS; NUMMILA PAKARINEN AULI (FI); MYHJAN () 19 August 1999 (1999-08-19 cited in the application the whole document	1-20						
Further documents are listed in the continuation of box C. Patent family members are listed in annex.								
*Y a document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the International filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date and not in conflict with the application but cited to understand the principle or theory underlying the cited to understand the principle or theory underlying the cited to understand the principle or theory underlying the cited to understand the principle or theory underlying the cited to understand the principle or theory underlying the cited to understand the principle or theory underlying the cited to understand the principle or theory underlying the cited to understand the principle or theory underlying the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone and the principle or theory underlying the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is combined with one or more other such document is combined with one or more other such document is combined with one or more other such document published prior to the international filing date but in the art. **S* document member of the same patent family								
Date of the actual completion of the international search Date of mailing of the international search report								
2:	3 September 2003	01/10/2003						
Name and m	nailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2	Authorized officer						
NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016		Van Golde, L						
	1 43. (1070) 575-4515							



INTERNATIONAL SEARCH REPORT

Internet Application No PCT/GB 03/03217

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 0773257	Α	14-05-1997	US	5736258 A	07-04-1998
			ΑT	238388 T	15-05-2003
			ΑU	699924 B2	17-12-1998
			ΑU	7065796 A	15-05-1997
			BR	9605484 A	11-08-1998
			CA	2189711 A1	08-05-1997
			CN	1195612 A	14-10-1998
			DE	69627611 D1	28-05-2003
			EΡ	0773257 A2	14-05-1997
			JP	3009855 B2	14-02-2000
			JP	9226006 A	02-09-1997
WO 9941310	A	19-08-1999	AU	741744 B2	06-12-2001
	•		ΑU	2425999 A	30-08-1999
			BR	9907836 A	24-10-2000
			CA	2320295 A1	19-08-1999
			CN	1296511 T	23-05-2001
			ΕP	1054927 A1	29-11-2000
			WO	9941310 A1	19-08-1999
			JP	2002503743 T	05-02-2002
			US	6552150 B1	22-04-2003
			ZA	9901048 A	11-08-1999